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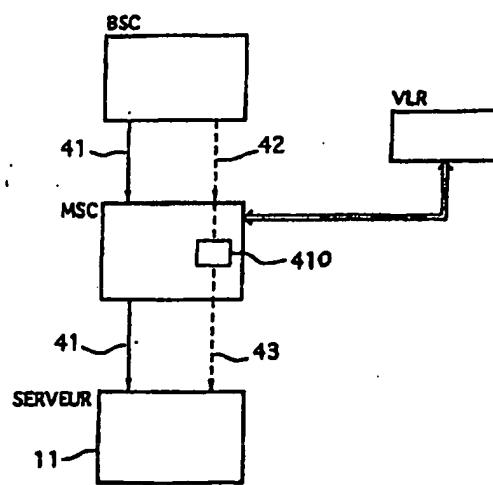
⑯ Système de radiocommunication cellulaire permettant l'accès à un service fonction de la localisation, module de prélevement et module de fourniture d'un service personnalisé correspondants.

⑯ L'invention concerne un système de radiocommunication cellulaire mis en œuvre au sein d'un réseau de cellules géographiques parcouru par des stations mobiles, ledit système comprenant des moyens (11) de fournir à une station mobile au moins un service personnalisé fonction d'une information de localisation géographique de ladite station mobile.

Selon l'invention, le système comprend:

- des moyens de reconnaissance et de dérivation d'un premier message de signalisation (42);
- des moyens de prélevement de l'information de localisation contenue dans le premier message de signalisation dérivé; et
- des moyens d'acheminement de ladite information de localisation prélevée vers lesdits moyens (11) de fournir au moins un service personnalisé lié à la localisation.

Le commutateur du service mobile (MSC) comprend des troisièmes moyens de construction d'un second message de signalisation (43) destiné auxdits moyens (11) de fournir au moins un service personnalisé lié à la localisation, et le second message de signalisation (43) est un message initial d'adresse (MIF) comprenant dans son champ "Identité du premier appelé" l'information de localisation.



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Cellular radiocommunications system allowing access to a location-dependent service, corresponding pickup module and module for delivering a personalised service**Publication number:** FR2711033**Publication date:** 1995-04-14**Inventor:** REMY JEAN-GABRIEL (FR)**Applicant:** COFIRA SA (FR)**Classification:**- international: **H04Q7/38; H04Q7/38; (IPC1-7): H04Q7/22; H04L12/16**- European: **H04Q7/38W; H04W2/02****Application number:** FR19940011293 19940916**Priority number(s):** FR19940011293 19940916; FR19930012050 19931005**Report a data error here****Abstract of FR2711033**

The invention relates to a cellular radiocommunications system implemented within a network of geographic cells traversed by mobile stations, the said system comprising means (11) for supplying a mobile station with at least one personalised service which is dependent on information on the geographical location of the said mobile station. According to the invention the system comprises: - means for recognising and deriving a first signalling message (42); - means for picking up the location information contained in the first derived signalling message; and - means for routing the said location information picked up towards the said means (11) for supplying at least one location-dependent personalised service. The switch of the mobile service (MSC) comprises third means for constructing a second signalling message (43) intended for the said means (11) of supplying at least one location-dependent personalised service, and the second signalling message (43) is an initial address message (MIF) including the location information in its "identity of the first called party" field.

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Cellular system of radiocommunication giving access to a service function of the localization, modulates taking away and modulates corresponding supply of a personalized service.

The field of the invention is that of the systems of cellular radiocommunication with mobile stations, in particular according to standard GSM (?Total System for Mobile communication? in Anglo-Saxon).

More < RTI ID=1.1> precisely, < /RTI> the present invention relates to a cellular system of radiocommunication including/understanding of the means, a waiter for example, making it possible to provide to a mobile station a service personalized function of information of localization of this mobile station.

In a way < RTI ID=1.2> general, < /RTI> I' invention can apply in all the cases where the waiter (or all means offering of the services of information) called by a mobile station uses information of localization of this mobile station to provide him one or more geographically personalized services.

An example of geographically personalized service is the supply at a mobile station of the address of < RTI ID=1.3> ithôtel< /RTI> who is closest for him.

One knows, in the state of the art, various types of means of information (waiter or others) < RTI ID=1.4> acce. S.sibles< /RTI> by mobile stations and offering services function of a geographical parameter of localization.

These various types of means of information function all according to the same principle of interrogation, namely: at the time of a first phase, the mobile station establishes a communication with means of information, then at the time of one second phase, the mobile station communicates to the means of information the parameters of localization necessary to the establishment of a geographically personalized answer.

This known principle < RTI ID=1.5> cl' iuterrogation< /RTI> present a major disadvantage to know the need for the mobile station < RTI ID=1.6> de< /RTI> to provide information on its geographical localization.

Indeed, this implies that the interrogation cannot be of short duration since it includes obligatorily two phases, the second phase (of communication of parameters of localization) claiming the intervention of the subscriber being in the mobile station.

Moreover, this subscriber can not know his geographical localization precisely or be mistaken at the time of the phase of communication of parameters of localization, which involves an insufficient or erroneous interrogation.

The invention aims in particular to mitigate this major disadvantage of the state of the art.

More precisely, an objective of the invention is to provide a cellular system of radiocommunication, implemented within a network of cells géographi< RTI ID=2.1> ques< /RTI> traversed by mobile stations, and including/understanding means of providing to a mobile station at least a service personalized function of information of geographical localization

▲ top of this mobile station, the subscriber being in the mobile station not having to announce with the means of providing a service personalized the place where it is. In other words, the interrogation of the means of providing a service must be automatic since the subscriber of the mobile station composed the number of these means of providing a service.

The invention aims also to provide such a system which can be carried out simply starting from any existing system of cellular radiocommunication.

Another objective of the invention is to provide such a system which allows a fast interrogation and without error, by a mobile station, means of providing a geographically personalized service.

An objective complementary to the invention is to provide such a system which can be carried out as well into analogical numerically.

These objectives, as of others which will appear thereafter, are achieved according to the invention using a system of < RTI ID=2.2> radiocommunication< /RTI> cellular implemented within a network of geographical cells traversed by mobile stations, the aforementioned system including/understanding of the means of providing to a mobile station at least a service personalized function of information of geographical localization of the aforesaid the mobile station, the aforementioned system being structured hierarchically in at least a subsystem of commutation and network connected to at least a subsystem of basic station, each subsystem of commutation and network including a switch of the mobile service in particular to which the aforementioned means are connected of providing at least a service, each subsystem of basic station including a controller of basic station in particular to which is connected at least a basic station, each basic station being associated of the aforesaid geographical cells, each subsystem of basic station including/understanding of the first means of construction of message allowing, for each communication of a mobile station towards one called, to work out a first message of indication containing in particular information of localization of the aforesaid the mobile station in the network of geographical cells, the aforementioned

first message of indication being intended for the switch of the mobile service of the subsystem of < RTI ID=3.1> commutation < /RTI> and of network to which the aforementioned subsystem of basic station is connected, and the aforementioned system including/understanding

- means of recognition and derivation of a first message indication corresponding to a communication of the aforesaid the mobile station average the aforementioned worms of < RTI ID=3.2> fourir < /RTI> at least a service;
- means of taking away of the aforesaid the information of localization contained in the first message of indication derived, and
- means of routing of the aforesaid the information of localization taken towards the aforementioned means of providing at least a service.

Thus, the principle of the invention consists, when the mobile station calls the means of providing a service, with going to seek in the data of indication information of localization existing and used only at ends of establishment of this call, between the subsystem of basic station and the subsystem of commutation and network. Once taken, this information of localization is transmitted to the means of providing a service which use it as parameter of interrogation.

It is clear that this new use of the information of localization (like parameter of interrogation, i.e. like useful data), has a purpose distinct from the use of origin (like data of indication).

Advantageously, the aforementioned means of providing at least a service are a waiter, this vocal or numerical waiter which can be.

Preferentially, the aforementioned means of providing at least a service belong to a fixed network connected to that the switch of the mobile service of each subsystem of basic station.

In an advantageous way, the aforementioned means of recognition and derivation are intended to that the switch of the mobile service.

Thus, the derivation of the first message of indication is carried out in a single place, by which all the communications are conveyed coming from the mobile stations, namely the switch of the mobile service (of the subsystem of commutation and network).

Advantageously, the aforementioned means of recognition and derivation are carried out in the form of semi-permanent connections.

In a first mode of advantageous realization of the invention, the aforementioned means of taking away of the information of localization are external to that the switch of the mobile service, belong to that the subsystem of commutation and network, and include/understand:

- first means of reception of the aforesaid first message of signpostion;
- first means of extraction of the aforesaid the information of localization contained in the aforementioned first message of indication received;
- second means of construction of message allowing to work out a complementary message container in particular the aforementioned information of extracted localization;

the aforementioned means of routing including/understanding a data link connecting the aforementioned means of taking away and the aforementioned average of providing at least a service, and conveying the aforementioned complementary message.

Thus, the means of providing a service receive on the one hand the communication coming from the mobile station and which was routée by the network thanks to various messages of indication, and on the other hand a complementary message transmitted by an independent way.

This first mode of realization of the invention thus requires simply the addition of new means and does not imply the modification of what exists. In other words, this first mode of realization is compatible with all the existing of systems of cellular radiocommunication, analogical types as well as numerical.

Advantageously, the aforementioned switch of mobile service includes/understands third means of construction of a second message of indication intended to that the means of providing at least a service, and the aforementioned means of providing at least a service include/understand means of buffer storage making it possible to synchronize the aforementioned second message of indication coming of the aforesaid switch of the mobile service and the aforementioned complementary message coming of the aforesaid means from taking away.

In this way, the interrogation itself takes place in the means of providing a service only when on the one hand the communication is established and on the other hand the complementary message (containing the information of localization in particular) arrived.

Preferentially, the aforementioned first message of indication also contains a first identifier of the mobile station and the number of the means of supply of at least a service, the aforementioned second message of indication containing in particular a second identifier of the mobile station and the aforementioned number of the means of supply of at least a service, the aforementioned external means of taking away also including/understanding:

- second means of extraction of the aforesaid first identifier of the station mobile contained in the aforementioned first message of indication received;
- first means of generation, starting from a translation table and of the aforesaid first identifier of the mobile station, a second identifier mobile station;
- third means of extraction of the aforesaid number of the means of supply of at least a service, contained in the aforementioned first message of indication < RTI ID=5.1> receipt; < /RTI>

and the aforementioned complementary message works out by the aforementioned second means of construction of message containing also the aforementioned second identifier of the mobile station and the aforementioned number of the means of providing at least a service.

Thus, the second message of indication (which allows the establishment of the communication between the mobile station and the means of providing a service) and the independently transmitted complementary message have common data, namely in particular the second identifier of the mobile station and the number of the means of providing a service. In this way, the means of providing a service can carry out a correlation between the message of indication and the complementary message, and deduce the service from it to be returned to the subscriber calling of a mobile station.

Advantageously, the aforementioned translation table making it possible to generate the aforementioned second identifier of the mobile station starting from known as the first identifier of the mobile station is updated thanks to a data base of localization belonging to that the subsystem of commutation and network.

For example, the aforementioned external means of taking away are included/understood in an additional waiter.

In a second mode of advantageous realization of the invention, the aforementioned switch of the mobile service includes/understands third means of construction of a second message of indication intended to that the means of < RTI ID=6.1> fournir < /RTI> at least a service, the aforementioned means of taking away of the information of localization being internal to that the switch of the service mobile and including/understanding:

- second means of reception of the aforesaid first message of indication
- fourth means of extraction of the aforesaid the information of localization of the aforesaid first message of indication received;

and the aforementioned second message of indication, worked out by the aforementioned third means of construction of message, container also the aforementioned information of extracted localization.

In other words, one adds in the second message of indication the information of localization extracted the first message of indication.

Thus, the means of providing a service receive only the communication coming from the mobile station, and which was routée by the network thanks to various messages of indication containing (according to the invention) the information of localization.

Advantageously, the aforementioned first message of indication also includes/understands a first identifier of the mobile station and the number of the means of supply of at least a service, the aforementioned second message of indication, which also includes/understands < RTI ID=7.1> ladite < /RTI> information of localization, in particular including a second identifier of the mobile station and the aforementioned number of the means of supply of at least a service.

Preferentially, the aforementioned internal means of taking away to that the switch of the mobile service belong to the group including/understanding: processors of treatment of calls and processors associated with a processor with treatment with calls.

In the case of the use of the processor of treatment of calls, it is enough to modify the algorithm implemented in this processor, in order to specifically treat the calls intended for a waiter offering a service dependent on geographical information.

In an advantageous way, the aforementioned second message of indication is an initial message of address including/understanding:

- in the field ?Identity of the first called? of the aforesaid initial message of address, the aforementioned information of localization, in the field ?Second byte of indicators? of the aforesaid initial message of address, on the one hand first additional information indicating the presence of information in the aforementioned field ?Identity of first called? and in addition one second additional information indicating that the aforementioned information presents in the field ?Identity of first called? is the aforementioned information of localization; and
- in Indicating field the ?of message? of the aforesaid initial message of address, third additional information indicating that the aforementioned field ?Identity of the first called? is used.

This initial message of address (or MIF) is a message of indication < RTI ID=7.2> CCI' IT < /RTI> < RTI ID=7.3> N " < /RTI> 7. According to this characteristic of the invention, one uses a field which is not used at the time of a direct call not returned, namely the field ?Identity of the first called?, to transmit the information of localization to the means of providing a service.

Thus, when the call of the mobile station is forwarded to these means of providing a service, the latter receive the MIF and extract information from it from localization < RTI ID=8.1> afin < /RTI> to deduce the service instantaneously from it to be returned to the mobile station.

In a particular mode of realization of the invention, the system is of the type GSM, and:

- the aforementioned subsystem of basic station is a BSS,
- the aforementioned controller of basic station is a BSC,
- the aforementioned subsystem of commutation and network is a NSS,
- the aforementioned switch of the mobile service is a MSC,
- the aforementioned information of localization is a BSIC.

Advantageously, the aforementioned first identifier of the mobile station is a TMSI, and the aforementioned second

identifier of the mobile station is a MSISDN.

Preferentially, the base given of localization is a VLR.

Information also relates to a module of taking away of information of localization of the type in particular made up of means of taking away included/understood in a cellular system of radiocommunication according to the invention.

Lastly, I' invention also relates to a module of supply at a mobile station of at least a service personalized function of information of localization of the aforesaid the mobile station, standard in particular made up of means of supply of at least a service included/understood in a system of cellular radiocommunication according to the invention.

Other characteristics and advantages of the invention will appear with the reading of the following description of two preferential modes of realization of the invention given as indicative and nonrestrictive example, and of the annexed drawings, in which:

- figure 1 presents a total diagram of an example of system of cellular radiocommunication according to the invention;
- figure 2 presents a logic diagram partial of a first mode of realization of the system according to the invention as presented on figure 1;
- figure 3 presents a detailed logic diagram of the additional waiter appearing on figure 2;
- figure 4 presents a logic diagram partial of a second mode of realization of the system according to the invention as presented on the < RTI ID=9.1> figure< /RTI> ;
- figure 5 presents a detailed logic diagram of the means of treatment indication appearing on figure 4; and
- figure 6 present in a simplified way an initial message of address such that used in the second mode of realization of the system according to the invention presented on figures 4 and 5.

The invention thus relates to a cellular system of radiocommunication allowing the interrogation, by a mobile station, means of providing a service personalized function of the localization.

The continuation of description presents the invention through the particular example of a system GSM (?Total System for Mobile Communication? in Anglo-Saxon) whose subscribers can reach a waiter offering services to them functions of their localization.

< RTI ID=9.2> 11< /RTI> is clear that the invention is not limited to only system GSM but concerne more generally any type of cellular system of radiocommunication (analogical or numerical).

In the same way, of many modes of realization of the means of providing a personalized service, others that a waiter, can be considered without leaving the framework of the invention.

The system GSM, whose total diagram is presented on figure 1, is structured hierarchically. Indeed, each subscriber is associated a mobile station ms allowing him to emit or receive calls all while moving in a predetermined space. This space of evolution of the mobile stations is broken up into a network of adjacent cells. With each cell a basic station BS < is associated; RTI ID=9.3> transmitting/récep-< /RTI> distinct trice. Basic stations BS are connected, by groups of 15 to 100, with a controller of basic station (or BSC for ?Base Station To control? in < RTI ID=9.4> anglisancon). < /RTI>

A controller of basic station BSC and the basic stations BS which are connected to him constitute a subset of basic station < RTI ID=10.1> (ou< /RTI> BSS for ?Base Subsystem Station? in Anglo-Saxon).

Several subsystems of basic stations BSS are connected to same a soussystème commutation and of network (or NSS for ?Network and Switching Center? in Anglo-Saxon). Each subsystem of commutation and network NSS includes/understands in particular a switch of the mobile service (or MSC for ?Mobile Switching services Center " in Anglo-Saxon) to which are connected the controllers of basic stations BSC of the subsystems of basic station BSS dependent on this subsystem of commutation and network NSS.

Lastly, the subsystems of commutation and network NSS, or more precisely the switches of mobile service MSC of the NSS, are connected between them, via one of the networks (fixed or not) existing 12, namely in particular the RTCP (Commutated Telephone Network Public) or the ISDN (Integrated services digital network).

The waiter (vocal or numerical) it offering services function of a localization is connected to the mobile switches of service MSC by < RTI ID=10.2> one < /RTI> of these intermediate networks 12.

When an subscriber of a mobile station ms wishes to obtain a service personalized function of his localization, it composes the specific number of the waiter < RTI ID=10.3> ii.< /RTI> This call is transmitted between the BSS on which depends the mobile station and the NSS to which this BSS is connected, then forwarded to the waiter Li via an intermediate network 12.

More precisely, the transmission of the call, consists in transmitting various data of indication. Thus, the BSS, when it receives the request for call of the mobile station, works out (in first means of construction of message not represented and generally located in the BSC) a first message of indication and transmits it to NSS. In order to allow the later establishment of the communication, this first message contains in particular information of localization of the mobile station in the network of geographical cells. This information of localization makes it possible to find it BSS from which the call comes, and more precisely the station basic with which is associated the mobile station (and thus the cell in which it find). The size of a cell being generally about 1 to 20 km, this information of localization is sufficiently precise to be used as parameter for < RTI ID=11.1> the interrogolition< /RTI> waiter < RTI ID=11.2> ii.< /RTI>

The principle of the invention consists to take this information of localization contained in the first message of indication transmitted between the BSS and the NSS, and to convey it to waiter 11.

Two modes of realization of this invention are described thereafter respectively with figures 2 and 3, and figures 4 to 6.

Figure 2 presents a logic diagram partial of a first mode of realization of the system according to the invention.

The controller of basic station BSC transmits to the switch mobile service MSC on the one hand a useful signal 21 (a signal of word for example) and of other by data of indication, in the form of a first message of indication 22.

In this example, the first message of indication includes in particular:

- a first identifier of the mobile station, namely a number TMSI (for ?Mobile Temporary < RTI ID=11.3> Subscnber< /RTI> Identify " in Anglo-Saxon);
- the call number; and
- information of < RTI ID=11.4> localisarion< /RTI> (i.e. identity of the cell traffic), namely a BSCI (for ?Base Station < RTI ID=11.5> Identify< /RTI> Code " in Anglo-Saxon).

The MSC includes/understands means 23 of recognition and derivation and means 24 of construction of a second message of indication.

The means 24 of construction of message always receive the first message of indication 22 and work out from this one a second message of indication 25.

This second message of indication < RTI ID=11.6> 25< /RTI> includes in particular:

- a second identifier of the mobile station, namely a number MSISDN (for ?Mobile Station ISDN Number? in Anglo-Saxon) obtained by transformation of the TMSI thanks to a data base (or VLR for ?Visiting Register Hiring? in Anglo-Saxon) containing tables of correspondence; and
- the call number.

When the call number is the number of the waiter < RTI ID=12.1> II< /RTI> providing the personalized service related to the localization, the means 23 of recognition and derivation, carried out for example in the form of semi-permanent connections, derive the first message from indication 22 towards a waiter appendix 26.

The waiter appendix 26 whose detailed diagram is presented on figure 3, includes/understands:

- means 31 of reception < RTI ID=12.2> du< /RTI> first message of indication 22;
- means 32 of extraction of the information of localization BSIC contained in the first message of indication;
- means 33 of extraction of first identifier TMSI of the station mobile contained in the first message of indication, and the means 34 of generation of a second identifier MSISDN of the mobile station with to leave first identifier TMSI and a translation table;
- means 35 of extraction of the number of the waiter < RTI ID=12.3> 1 1< /RTI> contents in first message of indication; and
- means 36 of construction of message allowing to work out one my wise complementary 37 container in particular: I' information of located tion BSIC, the second identifier of mobile station MSISDN and the naked one mero of the waiter < RTI ID=12.4> II.< /RTI>

The translation table used < RTI ID=12.5> pour< /RTI> means 34 of generation of the MSISDN is put < RTI ID=12.6> ajour< /RTI> by the base of data VLR.

The complementary message 37 is for example < RTI ID=12.7> transrnis< /RTI> with waiter 11 by a data link.

Waiter 11 thus receives:

- on the one hand, the signal of word 21 and the second message of indication 25, coming from the MSC; and
- in addition, the message < RTI ID=12.8> collplémentaire< /RTI> 37 coming from the additional waiter 26.

Waiter 11 can include/understand, in addition to means 27 of treatment itself (providing the geographically personalized service), of means 28 of buffer storage. These means 28 of buffer storage are located upstream means 27 of treatment and allow compenscr the temporary shifts of reception of the various received signals 21, 25, 37. For example, these means 28 of buffer storage make it possible the waiter It to receive the conllnunication (signal of word 21 and second message of indication 25) 'coming from the MSC, then to transmit a greeting message towards the mobile station while it acquires the information of localization contained in the complementary message 37 coming from the waiter appendix 26.

Figure 4 presents a logic diagram partial of a second mode of realization of the system according to the invention.

As in the first mode of < RTI ID=13.1> rt alisation, < /RTI> the BSC transmits to the MSC on the one hand a signal of word 41 and other < RTI ID=13.2> p.ll< /RTI> a first message of indication 42 (containing number TMSI, the number of the waiter < RTI ID=13.3> 1 1< /RTI> and the BSCI).

The MSC includes/understands in particular < RTI ID=13.4> moyens< /RTI> 410 of treatment of indication, receiving the first message of indication 42 and generating a second message of indication 43 bound for waiter 11.

These means 410 of treatment of the indication, whose detailed logic diagram is presented on figure 3, include in particular:

- means 51 of < RTI ID=13.5> reconn; ance< /RTI> and of derivation of the first message of indication 42;
- means 52 of reception < RTI ID=13.6> du< /RTI> first derived message of indication;

- means 53 of extraction of the information of localization BSIC contained in the first message of indication < RTI ID=13.7> receipt; et< /RTI>
- means 54 of < RTI ID=13.8> construction< /RTI> of the second message of indication 43.

These means 54 of construction < RTI ID=13.9> elc< /RTI> message receive on the one hand the first message of indication 42 (to be left < RTI ID=13.10> duqtcl< /RTI> they find the number of the waiter and number MSISDN) and in addition the BSIC coming from means 53 of extraction.

The second message of < RTI ID=13.11> signalisulun< /RTI> then includes/understands number MSISDN (identifying calling it), the number of the < RTI ID=13.12> serveur< /RTI> et the BSIC (information of localization).

The waiter receives the signal of parole and this second message of indication, and treats this last in order to extract < from it; RTI ID=13.13> I' information< /RTI> of localization and to deduce some instantaneous the personalized service related to the < lies; RTI ID=14.1> localisation< /RTI> to return to the subscriber present in the appealing mobile station.

In the example presented on figure 5, means 54 of construction of message are placed in the processor of treatment of calls 55 of the MSC and means 52 of reception and means 53 of extraction are placed in an associated processor 56.

It is clear that one can imagine other modes of realization, and in particular the use of the only processor of treatment of calls 55 in order to ensure the whole of the above mentioned functions.

The second message of indication 43 can be an initial message of address or MIF. The MIF is a message of indication < RTI ID=14.2> CCFIT< /RTI> < RTI ID=14.3> ne7< /RTI> delivered by the MSC and accompanying each communication. This MIF forwards on the network semaphore during the establishment of the communication.

As presented in a way simplified on figure 6, in the case of a call of the waiter by a mobile station, the corresponding MIF includes in particular:

- a field ?Identity of < RTI ID=14.4> lui< /RTI> appealing line " containing number MSISDN 61 of the mobile station;
- < RTI ID=14.5> - un< /RTI> field ?Addresses required? containing the number of waiter 62;
- a field ?Identity of the first called? containing information of localization BSIC 63;
- a field ?Second byte of indicators? containing on the one hand a première information < RTI ID=14.6> complénnitaire< /RTI> returned, and which is thus useless here since it is about a direct call not returned, makes it possible according to the second mode of realization of the invention to convey the information of localization BSIC between the MSC and the waiter.

< RTI ID=15.1> n< /RTI> is to be noted that in the < RTI ID=15.2> premicr< /RTI> mode of realization of the invention, presented before in relation to figures 2 and 3, the second message of indication can also be a MIF. In this case, the < RTI ID=15.3> Mr. IF< /RTI> contains in a traditional way the identity of basic station MSISDN and the number of the waiter, but does not contain the information of localization (which is transmitted independently after being extracted by the additional waiter).